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THE GAMBLING IMPULSE.

By CLEMENS J. FRANCE.

The present study is an attempt to investigate the origin and nature of the instincts and motives involved in chance plays and gambling. The writer has followed the biological or genetic method approach, calling upon the facts of biology, anthropology and history as aids in the solution of the problems encountered. The historical side has been especially emphasized as the writer has had in mind the ethical and sociological value of a contribution to the subject of gambling, as well as the psychological. From this point of view the historical aspects appealed to the writer as being of especial significance.

The writer takes great pleasure in expressing his thanks to President G. Stanley Hall who has been throughout the investigation a constant source of inspiration as well as of assistance. He also wishes to acknowledge the aid of Professor E. C. Sanford in giving much valuable criticism both as regards the form and content of the work, of Dr. Alexander Chamberlain in suggesting literature, and of Mr. L. N. Wilson, the Librarian of Clark University, in procuring a number of rare and valuable books.

Section 1. Historical. Gambling seems to be indigenous among all races. There is evidence of its antiquity both in Egyptian paintings and in materials of undoubted genuineness found in the tombs of this same people; among whom the practice was even attributed to the gods.¹ Evidence of the extent and danger of the habit is given from the fact that a man convicted of gambling in Egypt was condemned to work in the quarries.² Certain gambling games of the Chinese and Japanese are said to have been invented by the Emperor Yao, 2100 B. C.³ Gambling among the ancient Hindus, Wheeler tells us, became a madness. There are certain Hindu legends of Rajahs, playing for days in succession, until the loser is reduced to the condition of an exile or a slave.⁴ Among the ancient Persians

¹ Ashton: History of Gambling in England, p. 3.

² Steinmetz: Gaming Table, Vol. I, p. 57.

³ Ashton: *ibid.*, p. 4.

⁴ J. Talboys Wheeler: The History of India from the Earliest Days, Vol. I, pp. 175-185. London, 1868.

gambling was a common diversion. Plutarch in his life of Artaxerxes relates that Queen Parysates, the mother of the younger Cyrus, at one time "used all her skill in gambling to satiate her revenge and accomplish her bloodthirsty projects against the murderers of her favorite son."¹ The prohibitions in the Koran are unable to suppress the practice among the modern Persians.² History furnishes examples of people risking their lives on a single throw of the dice. St. Ambrose informs us that this was common with the ancient peoples, especially the Scythians. He also tells of how the Huns were ready to play at all times, even when at war; that they always carried their dice with them, guarding them as they would their arms.³ There is not much evidence that the ancient Jews ever gambled, except by drawing lots.

This practice was very common, and we know that the "promised land" was thus divided. Disney tells us that, in later days, the Jews did gamble and that gamesters were excluded from the magistracy, and were incapable of being chosen into the greater or lesser Sanhedrin; and that they could not be admitted as witnesses.⁴

"In China," says Huc, "gaming is prohibited and yet is carried on everywhere with almost unequalled passion. . . . China is, in fact, one vast gaming house. . . . The games are very numerous. They play day and night, till they have lost all they have, and then they usually hang themselves."⁵ Williams says "Gambling in China is universal. Hucksters at the roadside are provided with cup and saucer, and the clicking of dice is heard at every corner. A boy with but two cash prefers to risk their loss on the throw of a die, to simply buying a cake without trying the chance of getting it for nothing. Gambling houses are kept open by scores by paying bribes to the officers."⁶

In ancient Greece, also, gambling prevailed to a large extent. Philip of Macedon favored the practice, recognizing its corrupting influence on the Greeks. Aristotle ranked gamblers with thieves and plunderers (*Ethic ad Nicomachum*, lib. IV), and the Athenian orator, Callistratus, speaks of the desperate

¹ Steinmetz: *ibid.*, Vol. I, p. 57.

² Steinmetz: *ibid.*, Vol. I, p. 59.

³ Jean Barbeyrac: *Traite du Jeu*, 3 vols. Amsterdam, 1737. Tom. II, p. 345.

⁴ John Disney: *A View of Ancient Laws Against Sin, Morality and Profaneness*. Camb, 1729. Quoted from Ashton: *ibid.*, p. 5.

⁵ Huc: *Chinese Empire*. Quoted from Rouge et Noir, *Gambling World*, p. 35-36.

⁶ S. Wills Williams: *The Middle Kingdom*. New York, 1900. Vol. I, p. 825.

gambling in vogue. (Xenophon Hist. of Greece, lib. VI, C. III).¹

Evidence of extensive gambling at Rome is derived from the excavations of Pompeii and other places. "Sig. Rodolfo Lanciani says that, so intense was the love of the Roman for games of hazard that whenever he had excavated the pavement of a portico, basilica, bath or any flat surface, accessible to the public, he always found gaming tables engraved or scratched on the marble or stone slabs."² Ashton writes: "Notwithstanding the laws against it, there was hardly in Rome a more common or more ruinous pastime."³

Steinmetz devotes a chapter to the gambling amongst ancient Roman emperors.⁴ Augustus was passionately addicted to the practice, and even gloried in his character of a gamester. Caligula stooped even to falsehood and perjury at the gaming table. "The Emperor Claudius played like an imbecile and Nero like a madman." Nero would stake 400,000 sesterii (£20,000) on a single throw of the dice, and Claudius had the interior of his carriage arranged so that he could gamble on his journeys. Domitian was also an inveterate gambler. Juvenal, the contemporary of this emperor, writes: "When was the madness of games of chance more furious? Now-a-days not content with carrying his purse to the gaming table, the gamester conveys his iron chest to the playroom. It is there you witness the most terrible contests. Is it not madness to lose one hundred thousand sesterii and refuse a garment to a slave perishing with cold?"⁵ The rage at Rome seems to have kept on increasing until "finally at the epoch when Constantine abandoned Rome never to return, every inhabitant of that city, down to the populace, was addicted to gambling."⁶

That the ancient Germans were devoted to this form of play Tacitus testifies. They would not only stake all their wealth, but also their liberty.⁷ In modern times, it was in Germany where there existed the most celebrated gambling resorts of all Europe—Baden-Baden, Ems, Hombourg, Aix-la-chapelle, Wiesbaden. It was to these resorts that the wealth and nobility assembled during the 'cure-season.' "Princes and their subjects, fathers and sons, and even, horrible to say, mothers and daughters, would hang side by side, for half the night,

¹ Steinmetz: *ibid.*, Vol. I, pp. 59-61.

² Ashton: *ibid.*, p. 7.

³ Ashton: *ibid.*, p. 11-12.

⁴ *Ibid.*, Vol. I, Ch. IV.

⁵ Satire I, 87. Cf. Steinmetz, Vol. I, p. 67.

⁶ Steinmetz: *ibid.*, I, p. 68.

⁷ De Moribus German, Cap. XX, 14. Quoted from Jean Barbeyrac Traité du Jeu. Tom. II, p. 342-3.

with trembling hands and anxious eyes watching their chance card." ¹

The early French annals record that the 'haughty and idle lords were desperate gamblers,' and that the exercise of this impulse formed their chief occupation. In the reign of Charles VI, who himself gambled heavily, we read of the Hôtel de Nesle—famous for its terrible gaming catastrophies. 'Gambling went on in camp, and even in the presence of the enemy. Generals after having lost their own fortunes compromised the safety of their country.' Play among the lower classes was not excessive at this time;² but under Henry IV, every one seemed to catch the frenzy, all professions and trades being carried away by it. Magistrates sold for a price the permission to gamble. An Italian, a professional gambler, Pimentello, made 100,000 pounds in the course of a year; and there was scarcely a day but some one was ruined. The result of this state of things, says Steinmetz, was incalculable social affliction. All this gambling took place in the face of the most stringent laws against it.³ In the reign of Louis XIII the passion was pretty well suppressed, but in that of Louis XIV the practice prevailed in high circles, and as the king and queen regent both played, every one who had an expectation at court learned to play cards. Steinmetz says: 'Before this, there was something done for the improving of conversation; every one was ambitious to qualify himself for it by reading. But on the introducing of gaming men likewise left off tennis, billiards and other games of skill, and consequently became weaker and more sickly, more ignorant, less polished, more dissipated. . . The women, who till then had commanded respect, accustomed men to treat them with familiarity by spending the whole night with them at play. . . . At the death of Louis XIV three-fourths of the nation thought of nothing but gambling.'⁴ Dusaulx writes: "I have found cards and dice in many places where people were in want of bread. I have seen merchants and artisans staking gold by the hands full. A small farmer has just gambled away his harvest, valued at 3,000 francs."⁵ In the reign of Louis XVI the passion prevailed unabated, and was undoubtedly increased by the French revolution. At this time gambling was a source of not a little revenue to the government.

The English have always been notable for their propensity to

¹ Steinmetz: Vol. I, p. 157.

² Steinmetz: *ibid.*, Vol. I, p. 70.

³ Steinmetz: *ibid.*, Vol. I, pp. 78 ff.

⁴ Steinmetz: *ibid.*, Vol. I, pp. 87-88.

⁵ Dusaulx: *De la Passion du Jeu*, 1779. Quoted from Steinmetz, Vol. I, p. 105.

gamble; a writer familiar with the visitors at Monte Carlo says that the majority are English.¹ Hence we are not surprised to find that the use of dice in England is of great antiquity, dating from the advent of the Saxons, Danes, and Romans.² Ordericus Vitalis (1075-1143) tells us "that clergymen and bishops are fond of dice playing," and John, of Salisbury (1110-1182) calls it the damnable art. An edict of 1190 shows that gambling was common among the lower classes; also in the 13th and 14th centuries we have evidence of its prevalence.³ Cotton in his "*Complete Gamester*" gives a vivid description of the practice in the time of Elizabeth. And Lucas in his "*Lives of Notorious Gamblers*," gives proof that high play was common in the reigns of Charles II, James II, William III and Queen Anne.⁴ Legislation against card playing was made in the reign of Henry VIII, prohibiting the common people from playing except at Christmas.⁵ A book entitled "*The Nicker Nicked, or the Cheats of Gaming Discovered*" (1619), furnishes a good account of the gambling house of that period. The author says: "Most gamesters begin at small game; and, by degrees, if their money or estates hold out, they rise to great sums; some have played first of all their money, then their rings, coach and horses, even their wearing clothes and perukes; and then such a farm; and, at last, perhaps, a lordship."⁶

In the reign of Queen Anne the evil seems to have increased, especially among the women. Ward in a Satire, "*Adam and Eve Stript of their Furbelows*" (1705), has an article on the gambling lady of that period—entitled—"Bad Luck to Him who has Her; or the Gaming Lady." Steele devoted No. 120 of the "*Guardian*" (July 29, 1713,) to female gambling, in which he points out the ruinous effects attendant on the indulgence of it amongst ladies. "Nothing," he says, "so quickly wears out a fine face as the Vigils and cutting Passions of the card table. Hollow eyes, haggard looks, and pale complexions, these are the natural indications of a female gamester." He speaks of the danger to the moral nature and purity of a woman who has lost heavily. "She has then only her person to dispose of." Pope, also, in his *Rape of the Lock* (Canto III) gives a picture of the gambling lady and of the corrupting in-

¹ Rouge et Noir: Gambling World, p. 259.

² Ashton: *ibid.*, p. 12.

³ Ashton: *ibid.*, p. 13.

⁴ Theophilus Lucas: "Memoirs of the Lives, Intrigues and Comical Adventures of the most Famous Gamesters and Celebrated Sharpers in the Reigns of Charles II, James II, William III and Queen Anne." London, 1714.

⁵ Ashton: *ibid.*, p. 41.

⁶ Ashton: *ibid.*, pp. 45 ff.

fluence that the practice exerts upon her.¹ In the reign of George II the state of affairs continued as in previous reigns. A letter in the Grub Street Journal says, "The canker of gambling is surely eating into the very heart of the nation."

Gambling houses kept by women which had long existed and for a period were closed, were reopened at the end of the 18th century.² Gambling at this period was the chief amusement of women, as well as of men. Says Steinmetz: "At social gatherings it was vain to attempt conversation. The intellectual was inhibited by the impulsive. The time presents a picture of dissolute manners, as well as furious party spirit. The most fashionable ladies were immersed in play. The Sabbath was disregarded and moral duties neglected."³ Seymour Harcourt in his *Gaming Calendar* (1820) gives a vivid picture of the universality of the habit among all classes in the latter part of the 18th century. Gambling clubs, which later played so great a rôle, began now to rise into prominence. Two of these, White's and Brook's, deserve especial mention. "It was at White's Club that play was carried on to an extent, which made ravages in large fortunes, the traces of which have not disappeared at the present day. It was at White's that General Scott won £200,000. It was at Brook's that Charles James Fox, Selwyn, Lord Carlisle, Lord Robert Spencer and other great Whigs won and lost hundreds of thousands. The number of great men who played heavily, the number of fortunes wrecked at this time, is almost incredible."⁴ The Duke of Wellington in his early career lost a large sum of money at play, and was on the point of selling his commission to relieve himself from his debts of honor.⁵ Duels and suicides caused by gambling were common, as is shown by the Annual Register.

In the early part of the 19th century the passion had not abated. Ashton says: "The west end of London literally swarmed with gambling houses." One writer speaks thus of these gambling hells: "To these places thieves resort and such other loose characters as are lost to every feeling of honesty and shame. A table of this nature in full operation is a terrific sight; all the bad passions appertaining to the vicious propensities of mankind are portrayed in the countenances of the players. . . . Many in their desperation strip themselves on the spot of their clothes, either to stake against money or to pledge to the keeper of the table for a trifle to re-

¹ Ashton: *ibid.*, pp. 55 ff.

² Ashton: *ibid.*, pp. 76 ff.

³ *Ibid.*, Ch. VI, Rise and Progress of Modern Gambling in England.

⁴ Ashton: *ibid.*, cf. Chapter VI on these clubs.

⁵ Reminiscences: 3rd sec. Quoted from Ashton, *ibid.*, p. 99.

new their play, and many instances occur of men going home half naked, having lost their all."¹ Crockford's Club was the most noted of all the gambling houses in London. It is estimated that Crockford netted 300,000 pounds in the first two seasons alone. Ashton writes: "One may safely say without exaggeration that Crockford won the whole of the ready money of the then existing generation."²

The great gambling institution of England is that of horse-racing, or the turf, as it is commonly called. Every one has read of the famous English Derby. To-day, by means of a system of bookmaking, published in the daily papers, every one is enabled to gamble, and the extent of the practice is enormous. In the English Political Science Quarterly of November, 1900, attention is called to the extent and evil of this practice and an urgent plea made for reform.³

Brief reference only can be made to the few leading countries remaining. We know that the Russians, Italians, Spaniards and Japanese are all addicted to gambling. Alphonso X, of Castile, endeavored to prevent the practice, by founding in 1332 the Chivalric Order of the Band, in which it was forbidden. A further ordinance was issued by John I, King of Castile, in 1387, forbidding the subjects to play backgammon or dice. In 1506 because of the misery in Italy, arising from the indulgence of gambling, the Council of Ten forbade all forms of this play and all sale of dice and cards. This did not eradicate the evil. Toward the end of the last century gambling raged furiously at Venice. In 1774 the Graded Council ordered the close of a large public gambling house known as the *Ridotto*. To-day the State lottery in Italy is still in existence.⁴

The United States has not been excelled by the countries of Europe and Asia in their proneness to this form of play. Steinmetz says: "It is not surprising, that a people so intensely speculative, excitable and eager as the Americans, should be desperately addicted to gambling. Indeed, the spirit of gambling has incessantly pervaded all their operations, political, commercial, and social." We cannot go into the history here, but all know well the struggles our large cities have had and are still having to suppress this practice. Nor is it confined to large cities. The excessive gambling among the miners and lumbermen in the West is well known; the notoriety of Saratoga as a

¹ Frazer's Mag., 8, 191-206.

² *Ibid.*, p. 128, Ch. VIII, on Crockford's Club.

³ Any one interested in history of the English turf is referred to Ashton's chapter on this and that of Rouge et Noir, Gambling World.

⁴ Gambling World, p. 40-41. The reader who is interested will find in Steinmetz a chapter, Vol. I, Ch. XIV, on the laws against gambling in various countries.

great gambling resort a few years back is still fresh in our memories. A collection of stories by Mr. Lillard will give the reader an inside view of some aspects of the gambling carried on in the United States.¹ Mr. Lillard informs the writer that he has gambled and seen gambling in every State in the Union, and that the stories which he gives are very fair examples of many of his own experiences.

The history of lotteries and an account of the rôle they have played in society is a subject too extensive to be more than touched upon.² The lottery existed in ancient Rome and has flourished continuously until comparatively recent times. State lotteries have existed from the 15th century, and have been, in many countries, one of the chief sources of revenue. As an illustration of this, the following facts, of the part lotteries played in our own country, are instructive. MacMaster tells us that in 1790 cash had become so scarce that it was impossible to obtain money to pay the cost of local governments or to carry on works of public improvement, and that in consequence recourse was had to lotteries. "In a short time there was a wheel in every town large enough to boast of a court house or a jail. Wherever a clumsy bridge was to be thrown across a stream, a public building enlarged, a schoolhouse built, a street paved, a road repaired, a manufacturing company to be aided, a church assisted, or a college treasury replenished, a lottery bill was passed by the legislature, a wheel procured, a notice put in the papers, and often in a few weeks the money was raised.

It was the money collected from the sale of lottery tickets that Massachusetts encouraged cotton spinning, and paid the salaries of many of her officers, that the city hall was enlarged in New York, that the court house was built at Elizabeth, that the library was increased at Harvard, that many of the most pretentious buildings were put up at the Federal City. The custom, indeed, continued for several years, and the State wheel became as regular an item in the papers as the ships news or prices current."³

The following is a list of some of the lotteries and their purposes, collected at random by MacMaster from the newspapers for the year 1788-9: West River Bridge Lottery, Brattleborough, Vt.; Furnace Lottery, Fair Haven Iron Works, Vt.;

¹ *Poker Stories*, edited by J. F. B. Lillard. Francis P. Harper, publisher, 17 East 16th Street, New York.

² The reader is referred to Vol. I, Ch. XIII, in Steinmetz. To the *Gambling World*, by Rouge et Noir, Ch. VIII, for excellent accounts of lottery. Many excellent references may be obtained from Poole's Index.

³ MacMaster: *History of the People of the United States*, Vol. I, pp. 587-8. New York, 1883.

Windsor County Grammar School Lottery, Vt.; Mass. Semi-Annual State Lottery; Leicester Academy Lottery, Mass.; Hartford Bank Lottery, to build a bank along Connecticut River at Hartford; Bell Lottery, to procure a bell for the German Reform Church (Maryland); Petersburg Church Lottery (Va.); Alexander Lottery, to pave certain streets; Fredericksburg Academy Lottery (Va.); Lottery to enable the Hebrews to pay the debt on their synagogue (Penn.); Lottery to build a city hall at Philadelphia; New York City Lottery to enlarge the city hall for the use of Congress.

The result of this was very injurious to industry and business, as a general rage for speculation arose among all classes. MacMaster says: "Farmers and artisans, tradesmen and merchants were neglecting their businesses to watch the drawings of innumerable wheels."¹ In 1817 lotteries still existed. "The lotteries were almost as bad as the dram-shops and tippling-houses. The depression and excitement, that so invariably followed the drawing, diverted the laborer from his work, weakened his moral tone, consumed his earnings, and soon brought him to pauperism."²

To realize the extent of gambling in Europe at the present time a few facts about the expenditure of the greatest of modern gambling resorts, Monte Carlo, are instructive.³ The expenditure of the Casino runs into gigantic figures; for police and courts the administration pays per annum £20,000; for roads £8,000; for lighting and water £19,000; for clergy and schools £9,000; for maintenance of the Casino, including salaries, management, gardens, lighting, heating, etc., £800,000; for charity £6,000; for carnivals and prizes £11,000; for printing £2,000; for agents, pensioners, etc., £9,000; for the viaticum £12,000; for the reptile press £25,000; for theater and orchestra £40,000; an expenditure of upwards of £1,000,000. And yet the shareholders received in 1897 dividends to amount of £570,000. During 1891 the total revenue from the tables was a little over 23,000,000 francs. The dividends paid average about 38 per cent.

In closing this brief historical sketch the writer gives the following list of persons of note who have been especially addicted to gambling.⁴ Guido, the great painter, Voiture, Montague and Des Cartes in early life, Cardan, Lords Halifax, Anglesey and Shaftsbury, Lord Carlisle, Selwyn, Charles James

¹*Ibid.*, Vol. II, p. 23.

²MacMaster: *ibid.*, Vol. IV, p. 529.

³These figures are taken from Rouge et Noir's chapter on Monte Carlo in 'Gambling World,' pp. 254-5.

⁴Most of these are taken from Steinmetz's chapter on Gambling Poets, Savants, Philosophers, Wits, Statesmen. Vol. II, Ch. XI.

Fox, Wilberforce, Pitt, Sir Philip Francis, Horace Walpole, Marie Antoinette, Nell Gwynne. Webster and Clay, according to Lillard, were both great poker players.

Anthropological. The passion for gambling is nowhere so strong as among savage and barbarous races. The American Indians are the most desperate and reckless gamblers in the world. Some of them will not only lose all their possessions, but also will stake their wives and children and even their own liberty. The practice is thus a cause of much distress and poverty¹ in their families. Property changes hands with the greatest rapidity, a single throw at dice or a heat in a horse-race, often doubling the player's fortune or sending him forth an impoverished adventurer.² Among the Nahua nations the great national game is one played with a ball—the end being to throw the ball through a small opening—a feat seldom done except by chance. The successful player, Bancroft tells us, was made as much of, as the winner at the Olympian games. All classes gambled heavily on the issue. Among the Hurons the chief game is that of the dish (*jeu du plat*).³ "Large parties assemble to play this, during which the people not only lose their rest, but in some measure their reason. The players appear like people possessed, and the spectators are not more calm. They all make a thousand contortions, talk to the bones, load the spirits of the adverse party with imprecations, and the whole village echoes with howling." The game is in great repute as a medicine, the gambling parties often being ordered by the physician. The people all convene in a hut, the sick being brought in on mats.⁴ Among the Iroquois whole townships, and even whole tribes, play against each other. The assemblage would last sometimes eight days, meeting every day, every inhabitant of each township tossing the dice once.⁵

The Senecas had a popular belief that a certain gambling game would be enjoyed by them in the future life of the Great Spirit—which was an extravagant way of expressing their ad-

¹ Bancroft: *Races and Peoples*, Vol. I, pp. 113-114; 123, 219; 244; 353; 517; 587. Cf. also a paper by Stuart Culin, *Chess and Playing Cards*. Smithsonian Report, 1896. pp. 665-942.

² Stevens in *Pac. R. R. Rep.*, Vol. I, pp. 404, 412. Cf. Bancroft, Vol. I, p. 281, footnote.

³ Bancroft, II, pp. 299-301.

⁴ P. de Charlevoix: *Journal d'un Voyage dans l'Amerique Septentrionale*, Paris, 1744, III, p. 257. Quoted by Stuart Culin, "Chess and Playing Cards." Smithsonian Inst. Rep., 1896. pp. 721-2. Brebeuf: *Relations de Jesuites, Relation du l'annee*, 1636, Quebec, 1858. p. 113. Quoted from Stuart Culin, *ibid.*, p. 722.

⁵ Morgan: *League of the Iroquois*, Rochester, N. Y., 1851. Quoted by Culin, *ibid.*, p. 726.

miration for it. Among the Zúñis 'kicked stick' (Ti-kwa-we) is the great national game, and is indulged in from boys of five to men of forty. Every one, man, woman, and child, takes sides and gambles on the issue.¹ In many tribes women are as much addicted to this practice as men, and among some there are games peculiar to the women alone.²

Gambling is the chief recreation of the Malays of Sumatra, all classes indulging extensively in play. They risk high stakes on their success; in some instances a father will stake his wife or children; or a son, his mother and sisters.³ The Battas are also passionate gamblers. "They do not hesitate to risk all they possess, and often stake their own person, and if unable to pay are sold as slaves."⁴ The Javanese,⁵ Balinese,⁶ Sulus,⁷ Bugis,⁸ are all addicted to the practice. The ancient Mut-sams were inveterate gamblers, the gambling crowd being called together by the sound of the drum.⁹ So also the Patagonians are much devoted to gambling, the women as well as the men risking their valuables.¹⁰ Among the Usbegs, a nomadic people of Central Asia, the favorite game is the Ashik (*ahsek*—ankles bones of sheep) "played in the manner of European dice, and with a degree of passionate excitement of which one can form no idea."¹¹ So we find mention of gambling all over the world—among the Melanesians, Malaysians, Alaskans, Koreans, Hawaiians, African Negroes, in Brazil and in all the Latin Republics; amongst the natives of South America, amongst the natives of the Isle of Man, and even amongst the Icelanders.

The extremes, to which the gambler in his passion is led, are almost incredible. "It is well known that they have eaten up cards, crushed the dice, broken the tables, damaged the furniture, only to end in fights with each other."¹² We have record of a man who, enraged at play, jammed a billiard ball into his mouth, where it stuck fast until removed by a surgeon,¹³ of one who, having put a candle into his mouth, chewed

¹ J. G. Owens: Pop. Sci. Monthly, XXXIX, pp. 39-50.

² Culin: *ibid.*, 751-4; Bancroft, *ibid.*, I, p. 244. Col. R. S. Dodge, thirty-three years among our wild Indians, pp. 325-333.

³ A. Featherman: Social History of the Races of Mankind, Second Division, London, 1887, p. 302.

⁴ A. Featherman: *ibid.*, Second Division. Malao-Melanesians, p. 325.

⁵ A. Featherman: *ibid.*, p. 382.

⁶ A. Featherman: *ibid.*, p. 404.

⁷ A. Featherman: *ibid.*, p. 416.

⁸ A. Featherman: *ibid.*, p. 448.

⁹ A. Featherman: *ibid.*, Third Division, 1890, p. 16.

¹⁰ A. Featherman: *ibid.*, Third Division, p. 489.

¹¹ Arminius Vámbéry: Sketches of Central Asia, London, 1868, p. 110.

¹² Steinmetz: *ibid.*, II, p. 50 ff.

¹³ Steinmetz: *ibid.*, II, p. 52.

and swallowed it;¹ of a mad player at Naples, who bit the table with such violence that his teeth went deep into the wood, and who thus remained, nailed as it were, until he expired.² Steinmetz³ gives cases where loss at play resulted in stupefaction—some players neither knowing what they did or what they said; of a case of a man who cut off all the fleshy part of one of his ears to obtain money to play; two cases of men who, having tossed for each other's money, tossed to see which one would hang the other, the loser actually submitting to be hanged.⁴ Jean Barbeyrac cites a case of a man, who having gambled all his life, made in his will an injunction that his skin and membranes be used to cover a table, a dice box and draught board, and that dice be made out of his bones.⁵ Archdeacon Bruges mentions a similar case. There are a number of examples of men who have staked their wives.⁶ Parchasus Justus, who wrote a book to cure himself of the habit, tells of people who staked their teeth and eyebrows. Hyde found some Chinamen who staked the fingers of their hands; Schouten,—of Chinamen who staked the hairs of their heads.⁷ A gambler has told the writer he has seen a man shot in a game of poker, and thrown into a corner, while the rest continued the play.

Col. Mellesh was asked what were his feelings when he entered the battle of Vermeira. "Precisely the same," he replied, "as those I used to feel when laying a tremendous stake at Maco."⁸ Hon. Gen. Fitzpatrick once said: "If I could coin my heart and drop my blood into drachms, I would do it to play, though by this time I should probably have neither heart nor blood left."⁹ It is not an uncommon thing for ruined gamblers to go and sit up night after night watching the play of others. Voltaire cites a case of an old woman, ruined by gambling, who offered to make soup gratis for the players provided she might look on the game.¹⁰ Cotton in his "Compleat Gamester" writes of the passion as follows: "Gaming is an enchanting witchery, gotten between idleness and vice; an itching disease, that makes some scratch the head, whilst others, as if bitten by a Tarantula, are laughing themselves to death; or, lastly it is a paralytic distemper, which seizing the

¹ Dusaulx: *De la Passion du Jeu*. Cf. Steinmetz, *ibid.*, II, p. 54.

² *Gazette de Deux Point*, du 26, Novembre, 1772. Quoted from Steinmetz, *ibid.*, Vol. II, p. 53.

³ *Ibid.*, II, p. 54 ff.

⁴ *Annual Register*, 1812.

⁵ *Traité du Jeu*, Tom. II, p. 338-9.

⁶ Barbeyrac: *ibid.*, Tom. II, 342 ff.

⁷ Barbeyrac: *ibid.*, Tom. II, p. 345.

⁸ Frazer, 16, p. 16, Article, Anatomy of Gaming.

⁹ Steinmetz: *ibid.*, I, p. 300.

¹⁰ Steinmetz: *ibid.*, I, p. 66.

arm, the man cannot chuse but shake the elbow. It hath this ill property above all other vices, that it renders a man incapable of prosecuting any serious action, and makes him always unsatisfied with his own condition; he is either lifted to the top of mad joy with success, or plunged to the bottom of despair by misfortune; always in extremes, always in a storm; this minute the gamester's countenance is so serene and calm that one would think that nothing could disturb it, and the next minute so stormy and tempestuous that it threatens destruction to itself and others; and, as he is transported as he wins, so losing, is he tost upon the billows of a high swelling passion, till he hath lost sight of both sense and reason.¹ La Placette² says: "In order to conceive clearly the state in which the soul of the gambler finds itself, it is not sufficient simply to represent a sea always agitated; it is necessary to imagine that these agitations come from five or six opposite vents, which rule, each in its own course in such a way, that there is not one of them, which has not the advantage many times in the quarter of an hour." Barbeyrac writes: "I do not know if there is any other passion which allows less of repose and which one has so much difficulty in reducing." He cites anger as a passion of excessive violence, yet one which does not endure long in intensity; likewise ambition, and love. Each of these has its moments of cessation and decrease in intensity. "But the passion of gambling gives no time for breathing; it is an enemy which gives neither quarter nor truce; it is a persecutor, furious and indefatigable. The more one plays the more one wishes to play; one never leaves it, and with difficulty, one resolves to leave off a little while from dice and cards to satisfy the needs of nature; all the time he is not playing, the time seems to him lost; he is tired (*ennui*). When he does anything else; it seems that gambling had acquired the right to occupy all his thoughts. . . . Old age far from diminishing the ardor of this passion only results in re-enforcing it."³ Steinmetz writes: "The gamester lives only for the sensation of gaming. Menage tells us of a gamester who never saw any other luminary on the horizon but the moon. St. Eyremond says: 'All the rays of the gambler's existence terminate in play; it is on this that the center of his existence depends. He enjoys not an hour of calm serenity. During the day he longs for night, and during the night he dreads the return of day.'"⁴

¹ Cotton: *Compleat Gamester* (1674). Quoted from Ashton, *ibid.*, pp. 1-2.

² *Traité des Jeux de Hazard*, Ch. VII, p. 225 (or Ch. IX, p. 91 second Ed.) from Jean Barbeyrac, Tom. II, p. 236.

³ *Ibid.*, pp. 336-38, Tom. II.

⁴ Steinmetz: *ibid.*, Vol. II, Ch. III.

Section 2. In order to obtain data in regard to the tendency to run risks in every day life the following syllabus was circulated:

TOPICAL SYLLABUS.

PSYCHOLOGY OF UNCERTAINTY.

I. Are there times when you desire to risk something, take chances—materially, socially, spiritually; have an impulse to act in total ignorance of consequences? State frequency and strength of such impulses. Describe any case in your life when you have so acted. State your feelings when you had given in to the impulse. If result was good, how affected? If bad, how? Effect on future acts? In taking risks have you been more successful or unsuccessful as a rule?

II. Give any case where of two or more possible lines of action you have chosen one off hand and trusted to chance, *e. g.*, in deciding on a school or college, profession, how to spend vacation, or any decision of major or minor import in which you were actuated more by impulse than from data. State your feelings after the decision, *e. g.*, satisfied or dissatisfied, worry or relief, determination to act decreased or increased. Give any instance in your life where such an impulse to act and trust to chance has interfered with thinking out, or working out, to its end, some uncertain matter. Do such impulses influence you to decide or act before looking at the matter from all sides? Do you ever come to a decision by tossing up a coin?

III. Describe your habits of action in little affairs such as going out without rubbers, coat or umbrella, sitting in draughts, taking chances of its not raining or your not catching cold. Describe a case of person who acts thus habitually—saying “Oh I’ll be all right.” Give case of opposite type who runs no risks, wants insurance and security in everything.

IV. Do you like to know far ahead what you are going to do or what is going to happen? Do you make certain definite arrangements very far ahead, *e. g.*, as to how spend vacation, etc.? Is desire to be uncertain dependent on whether you feel cheerful and hopeful, or despondent melancholy? If so, which? Name any things you would prefer to be certain about. Some—uncertain. How about future state after this life? In this life?

V. Do you ever have idea of putting aside a certain portion of your income to devote to speculation? Describe any case in your own experience or in that of another speculating. Did stick to limit set? Win or lose? Effect in either case on conduct, *e. g.*, general bearing toward fellows, future speculation. If lost was he unconsolable, indulging in self pity?

VI. (a) Give a case of person—continually and by nature lucky. One of person who imagines himself lucky. Cases of opposite. Are you as a rule lucky?

(b) Are there days when you get up in the morning and feel: To-day I will be lucky? How are actions affected, *e. g.*, act bolder, more likely to venture? Give a specific case—your general state of feeling, any previous events acting as a cause, etc.

(c) Give any instance in which winning at a game of chance, being successful after having run a risk, encouraged you in your exertions or led you to undertake what you lacked confidence for previously. If you do not remember any case, state feelings in general following the success of an uncertain undertaking.

(d) Comment on your feelings of safety when going on cars or water, running risks of any kind. Do you dislike being cautioned to be careful? What is the effect of such caution?

VII. (a) In hearing about "breaking bank at Monte Carlo" or of some lottery did you ever have the thought come—"I believe I would be the one to break the bank or win the prize?" Comment on your feelings here. Is there a tendency, you have to guard against, to venture on lottery schemes and the like? Have you ever gambled in any form whatever or even made believe you were gambling?

(b) Do you ever have idea that some day things are coming your way, something going to turn up? Comment.

In all 443 returns were received. Of these 70 were males; 340 females; in 33 cases the sex was not given. The answers fall within three groups. (1) A group in which the subjects have frequent and strong impulses to break away from their daily routine and enter on some venturesome undertaking. In this group is found a fairly strong habit of risking. This comprises about 18.6% of the whole number. (2) A group in which subjects are extremely cautious and feel strongly averse to taking any risk. This group comprises 12%. (3) A group wherein there is exhibited no marked inclination or disinclination to run risks; in this group the subjects often enter upon risky undertakings with a certain degree of enjoyment, but are as apt not to take the venture as to take it. In small affairs they are not over cautious, but in large ones, where much is to be lost or won, they hesitate to venture; and unless the object to be gained is something greatly desired they choose not to run the risk. This group comprises 69.4% of the whole. There were 238 cases cited, or nearly 58% of subjects who frequently took risks in small affairs, as going without rubbers, etc. There are 115 cases, or 28%, where caution was exhibited in these small affairs. In the remaining 24% taking risks or exercising caution depended on the mood. In 224 cases caution from some other person was much disliked. In 52 cases no dislike of being cautioned was felt. In 64 cases being cautioned made more reckless, and in 29 cases the subjects did the thing they were cautioned against. In 75 cases subjects are influenced to be more cautious because of failure in their previous risks. In 91 cases subjects are influenced to be more venturesome because of success in previous risks, and in 24 cases subjects even when successful are inclined to be more cautious because of the worry, fear and strain. There were 121 cases where subjects decided affairs off hand, that is they trusted to chance rather than reasoning over the matter in all its aspects. There were 111 cases where tossing a coin or the like was resorted to as a means of deciding small affairs. There were 107 cases of persons who had gambled more or less, and 27 cases where persons had made believe gamble. Of 162 cases of persons who answered as to whether they believed themselves more successful or reverse in taking risks—109 considered themselves more successful; 53 less.

The following is an enumeration of some affairs decided off hand:

In deciding on the advisability of going to a certain place as an entertainment, etc., 56 cases; in choosing a school, 25 cases; in deciding on the manner of spending one's vacation, 20 cases; in choosing a profession, 8 cases; in buying a dress, 6 cases; in deciding on a course of study, 4 cases; in choosing between two schools to teach, 2 cases; neglecting bad eyes, 2.

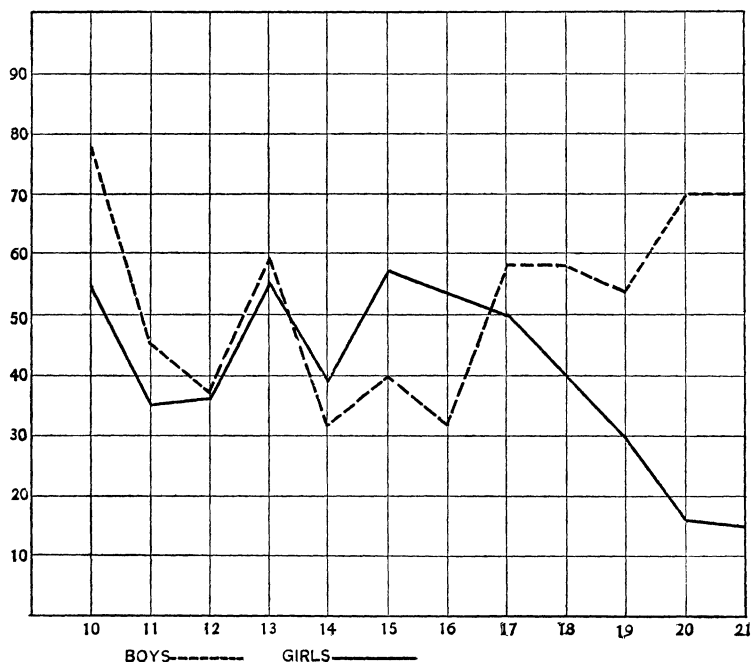
Below is an enumeration of some common risks taken:

Entering a class unprepared, hoping not to be called, 72 cases; taking chances at fairs, betting, 29 cases; going to places which are forbidden, trusting not to be caught, 25 cases; entering on an outing when weather threatens, rain or storm, 19 cases; breaking rules of school, 17 cases; tossing penny or drawing lots to decide who will perform some obnoxious task, 15 cases; skating on thin ice, 10; taking risks on water, 10; in playing cards, 10; in bicycle riding, 10; in buying articles, 10; wearing thin dresses in winter, 7; running in front of trolley car or wagon, 6; risking being late to catch a train, 6; crossing dangerous bridges, 4; going out in a bad storm, 4; smoking, trusting that they would not be detected, 3; going out with a severe cold, 3; take risk of being met at train, 3; driving a fractious horse, 2; going out when visitors were expected, risk getting back, 2; taking horse when did not know whether it was needed, 2; running the risk of offending friends, 2; neglecting bad eyes, 2; one each—kissed a friend who had typhoid fever; jumping from high window; went on a rickety toboggan slide; risked losing dinner; took risk of ticket being good on a certain train; removed brace on teeth; climbing high trees; delayed taking train expected to be met on; took chance of succeeding in a school other teachers had been failing in; rode a horse who always tried to run away; doing daring things in gymnasium; man who works in Turkish bath goes out on street late at night with only a towel about his loins; rode horse afraid of cars along railroad track; driving horse down a steep hill without any breeching; going out, risk some one's coming who am desirous of seeing; jumping from a fast moving train; jumping from high trees; dropping from beams in the barn; diving into water from high spring board or over over-hanging trees; risk being late for recitation; go to see some one at a distance, risk their being in; cutting out a dress without a pattern, trusting it will be right; going away from home and leaving babies with the younger children; wearing sister's clothes; climb in dangerous places; starting on expeditions with little money; risks in business, trusting men know nothing about; crossing a high long railroad bridge; walking on slippery logs across water; wear new dress in rain to party; coasting on a dangerous, forbidden hill at night; in case of sickness do not send for doctor; entered upon a normal course without assurance of assistance; stopped a runaway team hitched to a bindery, but had to run in front of the knives; riding on an engine; jumping off and on moving cars; buying a wheel.

To arrive at some further knowledge in regard to the tendency to take chances, especially among boys and girls about the period of adolescence, the following question was given:

"Suppose two days vacation was offered you, and suppose I came to you with two slips of paper in my hand, a long slip and a short slip, and said, 'If you draw the long slip, instead

of two days, you can have three, but if you draw the short slip, instead of two days, you can have only one. You are free to draw or not. Will you draw?" All question of the moral right or wrong in drawing was, as far as possible, eliminated, also those cases in which the student preferred the short vacation to the long one. In all 776 answers were received from students, ranging from 10 to 22 years of age; boys, 370; girls, 406. Of these, 176 of the boys answered yes, 194, no; and 183 of girls answered yes; 223, no. These figures tell little, but the following curves, showing the answers by ages, are of interest.



Though these curves have little scientific validity, due to the smallness of the numbers, yet they present certain interesting and suggestive features. The fact that the boys' curve rises, as the ages approach those of maturity, we believe to be in line with the general biological thesis of the male being the more iconoclastic, exploiting and venturesome element, while the fact, that the curve of the girls falls, is, on the other hand, in line with the biological thesis, that woman is the conservative and cautious element. It is interesting to note that the boys' curve is lowest at the ages 14, 15, 16, that period which coincides with the average age of puberty, a period in which we know

that feelings of uncertainty, vague fears, etc., are rife. At 17 the boys' curve takes a rapid rise. So with girls at the ages 11, 12, and 14, the curve is low—being at 14 at its lowest point—after which it takes a sudden rise, being at its highest point in years 16, 17, 18. We know that after the dawn of the adolescent period there is a great rise in feelings of self-confidence, power, etc. This may account for the curve being at a high point at this time with the girls, and also the sudden rise of that of the boys at 17. The girls' curve being high at 13 may be in an apparent contradiction to these suggestions; however it may be that these girls already had past the period of storm and stress, incident on the dawn of adolescence.

Inadequate as the above data are in point of number, range of age and sex, and trivial as they appear, they nevertheless are of much suggestive value. The solution of the problem of why certain people are inclined to run risks, why they have so strong a belief in their luck, has not a little light thrown upon it by considering these trivial circumstances. We see how strongly they influence future actions and feelings—a little success often raising up a great wave of confidence, a little failure causing great caution and fear. The feeling is far out of proportion to the stimulus. The fact is that we are playing on the two great hereditary chords—fear and faith, as regards personal safety—each of which in turn controls our actions. It is these slight circumstances which exercise and give growth to these factors, and if each man were constitutionally inclined, neither strongly towards the one or the other, the one of these excised the most, *i. e.*, the weight thrown on the fear side or faith side, according to failure or success, would grow most rapidly, until by little increments of success or failure one would find himself an optimist or a pessimist—with strong belief that the powers of the universe were for or against him. But probably no two start out with equal endowments of the hereditary faith and fear instinctive tendencies. The whole matter seems to center about these two pivots—faith in self—and distrust of self. On the one side we have the man who enjoys taking risks, who says he is, as a rule, successful; who thinks he is lucky; that something, some day, is coming his way; who is careless in little affairs of health, has strong faith that he will be admitted to heaven, and in general feels he is a "Glückskind." On the other, the opposite who is always cautious, and fearful, who, even when successful in taking risks, cares not to take them again because of the worry and strain; who is a little uncertain about heaven, and is inclined to think that he is unlucky and never had an idea of anything occurring in his favor.

The conditions, under which the impulse to take risks arises,

are of interest, as it seems to occur when the affective curve of pleasure-pain is at its highest or lowest point—in a state of extreme good feeling or bad, when either joyful or sorrowful, when fatigued; one case when the person felt she was about to fail in something. There seem to be two especial ends in view—one the love of an uncertain state of mind and the charm of danger, with the resulting mental and bodily tension and suspense; the other a semi-unconscious yearning toward the "Ground" of things, to get a clue to my relation thereto—am I lucky or unlucky? to get a conviction of safety, a play upon the two instinctive factors of action and passion—faith, and fear.

Section 3. Psychological theories of the gambling impulse are few in number and inadequate in treatment. What little the writer has found is summed up in the following. Steinmetz gives these points: (1) A desire for a stimulus to call forth the natural activity of the mind; indolence, vacuity—being the cause. (2) Love of wealth. (3) It intensifies and gives rise to such feelings as vanity, curiosity, surprise.¹ Another writer² says that the passion is due (1) "to avarice—as promising either a vast accession of wealth, or a short road to the possession of it;" (2) to a deficiency in what in physics is called a stimulus.

Ribot, speaking of plays and games in general, says: "This last item (games of chance) alone might prove a tempting one to a psychologist. It has a quasi-passive, somewhat blunted form which Pascal called a diversion (that which turns aside, distracts), a way of pretending to work, or filling up the blanks in existence, of 'killing time.' It has an active form, the gambling passion whose tragedy is as old as humanity, and which is made up of attraction toward the unknown and hazardous, of daring, emulation, of the desire for victory, the love of gain, and the fascination of acquiring wealth wholesale, instantaneously, without effort. These and other elements show that in play, as in love, it is complexity which produces intensity."³

A writer in the *Spectator*⁴ takes up arms against those who attribute the impulse to avarice. (1) "No really avaricious person ever gambles, for the pain of paying his losses overcomes both the pleasure of the game and the pleasure derived from winning." (2) "Nor is gaming a mark of inner effeminacy, of a desire for excitement to be gained without exertion." He cites Bismark and Count Cavour, men of the greatest

¹*Ibid.*, Vol. I, p. 24.

²Nimrod: *Anatomy of Gaming*, *Frazer's Mag.*, Vol. XVI, pp. 9-24.

³*Psychology of the Emotions*, New York, 1897, p. 31, footnote.

⁴*Spectator*, Vol. LXVI, p. 286. "The Gambling Instinct."

energy—addicted to high play. (3) "Nor is the gambler at heart a cheat." (4) "The true temptation is the desire which prompts most men to drink hard,—love of excitement, a desire to forget self and be rid of the monotony of the common place." Apropos of the above is the observation of Drähms, who says: "The professional gambler is prodigal and generous, especially toward those in distress, and for religious and moral purposes."¹

Prof. Lazarus's treatment² contains the following points: (1) The state of tension (*schweben*) is sought; avarice being entirely subordinate. (2) Hope and fear are dominant states—with especial emphasis on hope. He thinks the state lottery partially justifiable because it gives the poor people something to hope for. "Man can live without pleasure, but not without hope." (3) Gambling satisfies the positive attraction for danger, present in many men. (4) It satisfies the feeling that we are lucky; emphasizes the efficacy of the idea of Fate in overcoming the idea of blind chance; is the abandonment of reason and giving oneself up to superstition.

Mr. Thomas, in a paper in the *American Journal of Sociology*,³ gives some interesting points in regard to the gambling instinct. He bases the instinct primarily on what he calls the conflict interest, which will be best understood by quoting his own words: "There could not have been developed an organism, depending on offensive and defensive movements for food and life, without interest in what we call a dangerous and precarious situation. A type without this interest would have been defective and would have dropped out in the course of development." That this interest prevails, he considers "a sign of continued animal health and instinct in the race." Thomas also lays stress on the desire to get rid of routine,—pointing out that those professions in which there is an element of work and uncertainty, are more popular and more often chosen, as competitive business, the stock market, the learned professions; and among the less intelligent—the callings of policemen, firemen, detectives, livery stablemen, barkeepers, barbers. He sums up: "Gambling as a means of keeping up the conflict interest, and of securing all the pleasure-pain sensations of conflict activity with little effort and no drudgery; and, incidentally or habitually, it may be a means of securing money." He believes—"the instinct is born in all normal persons. It is one expression of a powerful reflex, fixed far back in animal experience. The instinct is, in itself, right and indispensable, but we discriminate between its applications." He holds that the gambler by profession is

¹ The Criminal, New York, 1900, p. 119.

² Prof. M. Lazarus: *Reize des Spiels*, Berlin, 1883, pp. 58-88.

³ Vol. VI, pp. 751-763. The Gambling Instinct, W. I. Thomas.

often of a high type of man—intelligent, and not degenerate. There is no special gambling type; at worst, he is but representative of a class of men who have not been “weaned from their instincts.”

In the following the writer attempts to analyze the factors involved. His conclusions are based on questioning and correspondence with some twenty gamblers, on personal observations in gambling resorts, on a large amount of literature, historical and descriptive, on an analysis of over a hundred stories of gambling, written by gamblers,¹ and accounts of the lives of gamblers.²

The psychic attitude toward uncertainty—the state of suspense—is the most natural starting point.

Prof. Lazarus says: “The pleasure in all chance plays consists fundamentally in suspended activity; in dice, roulette, and faro, nothing of more importance can be discovered than the mental tensity because of the question: ‘Will it be seven or eleven; a little or a great number?’ This ‘oder’ (either—or) is a mighty psychological force, an irresistible attracting magnet.”³ We have here curiosity and something added—the feeling of expectation in which, as Wundt says, we outrun the impressions of the present and anticipate those the future will bring, and if the result is postponed there arises strained expectation, in which the muscles are held tensed like those of a runner awaiting the signal for the race, although very possibly the impression demands no motor response whatsoever.⁴

When the stake is added there arises all the pleasure of pursuit with increase of intensity, for as Bain says: “An element of uncertainty increases the interest of pursuit by making it more exciting; . . . absolute certainty unduly relaxes the bodily and mental strain that is needed for the maximum of gratification.”⁵ “The purest form of pleasurable excitement,” says Sully, “is afforded by a set of circumstances which opens up a number of possible issues though we have not the knowledge to determine which is most probable.”⁶ We have here ideal conditions for arousal and imagination.

A case is reported of a man who for many years was a spectator at one and the same table without participating in the

¹ Curtis: *Queer Luck*; J. F. B. Lillard, *Poker Stories*, New York, 1896, pp. 231; Clarence L. Cullen, *Taking Chances*, New York, 1900, pp. 269.

² Especially the “Lives” of Lucas, *ibid.*

³ *Reize des Spiels*, p. 59.

⁴ *Lectures on Human and Animal Psychol.*, London, 1897, p. 376.

⁵ *Emotions and Will*, London, 1899, pp. 220 ff.

⁶ *Sensation and Intuition*, p. 298, *cf.* Bain, *ibid.*, p. 222.

play. A dispute arising, he was asked to make a decision, as he must know best the laws of the game. He replied that he did not know the game; that he had only looked on to observe where the best cards fell.¹

At any gambling table, where it is permitted, you will observe spectators watching with strained attention to see where the wheel will stop or which card will turn up. The writer has found it difficult to leave such a table after standing a few minutes merely to observe what number will win next. In any uncertain event there is the same attracting force, and although one may have no interest in either side, there is always a tendency to speculate on the outcome. This constitutes a large part of the philosophy of life, resolving the uncertainties into certainties. George Eliot writes: "So absolute is our souls' need of something hidden and uncertain for the maintenance of that doubt and hope and effort which are the breath of life, that if the whole future were laid bare to us beyond to-day, the interest of all mankind would be bent on the hours that lie between; we should pant after the uncertainties of our one morning and of our one afternoon; we would rush fiercely to the exchange for our last opportunity of speculation, or success, or disappointment, we should have a glut of political prophets, foretelling a crisis or a no crisis, within the only few hours left open to prophecy."²

The race has been evolved in an environment of uncertainty, and it may be that such an environment has thus become indispensable. It cannot be doubted that the state of mental tension, of being on the alert with ears pricked and nose in the air, is a factor of high selective value. We have reason to believe that this state of expectation not only links together and sets in a condition of unstable equilibrium motor centers, but also that in the higher association centers there is a preparatory condition produced. On this assumption the metabolism of both brain and body would be increased, and consequently the potential efficiency of the given moment. Not only reflex action and muscular co-ordination, but also memory, imagination, and judgment times would be quickened. Is it not thus that a condition of uncertainty holds the mind in a tonic and unrelaxed condition? As evidence that, as we approximate a dead level certainty, we tend to lose in mental efficiency, we have the case of the arrested development of the Chinese. It is significant in the case of the Chinese that the passion for uncertainty, having no exercise in the serious side of life, shows

¹ Lazarus: *ibid.*, p. 58.

² The Lifted Veil. In Silas Manner. Clerical Tales. p. 190. Hurst and Co.

itself in the form of play—they being the greatest gamblers in the world. It is then this need of mental tension, this “either—or” state, which is one of the chief factors in chance games and gambling.

The addition of the stake brings in a whole train of added states centering about the feeling of power. Hope and fear, joy and sorrow—are especially predominant. It is significant to note that hope must at the moment of action predominate over fear—a necessary biological condition of all action in uncertainty. Again in connection with this playing power, we find arising emulation, aggression, the instinct of domination, with the love of humiliating one's opponent, much allied to the bullying and teasing tendency, pugnacity—with all the resulting emotions.¹ Jealousy and envy are especially strong in the mind of the loser. In the great American game—Draw Poker—the battle element is especially predominant. It is here also that the “bluff” plays so great a role—the attempt to beat your opponent by sheer boldness and self-confidence. The psychic effects of this are significant. It makes the man who bluffs play better and the opponent play worse. The psychic effects of the bluffer in every day life only need to be mentioned.

There are many minor factors indispensable to the success of the gambler,—the cultivation of a calm and passionate demeanor in moments of crisis, never displaying any emotion or hesitancy; the ability to recover quickly from defeat; being ever vigilant and attentive; acquiring the habit of studying your opponent most closely; few men being better “sizers up” of men than the gambler; a sufficient degree of caution tempering your boldness; the learning how to bear sanely good fortune, as well as bad. These fit closely the essentials of any active, exploiting life. But for its costliness and dangers, no better education for life among men could be devised than the gambling table—especially the poker game.

The phase of gambling known as betting is important. The practice is very ancient. At one time in England it became a mania.² It has its basis in the tendency to make dogmatic statements on the outcome of uncertain events and the strong inclination to throw your lot in with one possibility. Dr. Small in his monograph on certainty, in which he showed the tendency to make strong assertions regarding certain events, only stated half the truth. The whole history of partisanship, dogmatism and fanaticism is in point, for these are but an out-

¹ The reader is referred for a more lengthy account of the battle element to Mr. Thomas's article, *Gambling Instinct*, *Amer. Jour. of Sociol.*, Vol. VI, pp. 751 ff.

² Early part of the 18th century, *cf.* Ashton, *ibid.*, chapter on Betting.

crop of this tendency plus some interest at stake. Its simplest form is the "I'll bet you" one hears a dozen times a day. A man often will take either side, but after backing one he is apt to believe in it. The wide pedagogical and ethical bearings are evident.

The possibility of getting something for nothing, and that quickly, is another of the salient features in gambling. It is the basis of the stock exchange, of many exploring expeditions, the explanation of such phenomena as the Keeley motor, the Miller syndicate, Mrs. Howe's bank, the Rev. Mr. Jernegan's scheme of obtaining gold from sea water, etc. The credulity of people in the presence of such frauds is most wonderful. This speculating tendency has two or three times in the course of history manifested itself in an extraordinary degree. Two of these, the South Sea Company, better known as the South Sea Bubble, and John Law's Mississippi scheme, all but financially wrecked England and France, respectively.

John Law, who in 1817 was in control of the French finances, issued bonds on large tracts of land along the Mississippi River. The paper was in the shape of stocks, bearing interest. The scheme worked so well, Law issued a second large amount. The whole French people went mad in speculating. McKay¹ says: "People of every age and sex and condition in life speculated on the rise and fall of these bonds. . . . There was not a person of note among the aristocracy, except the Duke of St. Simon and Marshall Villars, who was not engaged in buying and selling stock. Gamblers with their roulette tables reaped a golden or rather a paper harvest from the throng." Wood says: "The frenzy prevailed so far that the whole nation—clergy, peers and plebians, statesmen, princes, nay, even ladies, turned stock jobbers."² It is worthy of note that Law was a Scotch adventurer, and had been for many years a gambler.³

About the same time in England the South Sea Company began to sell stocks, claiming the company had rich lands in the South Seas, and promising enormous dividends. McKay writes: "It seemed as if the whole nation had turned stock jobbers. . . . The inordinate thirst for gain affected all ranks of society. . . . Besides the South Sea, innumerable other companies started up everywhere. There were nearly a hundred of these projects or bubbles—extravagant to the last degree, yet the people were hypnotized by the craze of speculation. . . . It has been computed that nearly

¹ *Memoirs of Extraordinary Delusions*, Vol. I, p. 14.

² J. P. Wood: *Memoirs of John Law*, Edinburgh, 1824, p. 14.

³ H. D. Adams: *Under Many Flags*, New York, 1896, p. 174, *cf.* also Wood, *ibid.*

one million and a half sterling were won and lost by these practices. . . . In the heyday of its blood, during the progress of this dangerous delusion, the manners of the nation became sensibly corrupted. . . . It is a deeply interesting study to investigate all the evils that were the result. Nations, like individuals, cannot become gamblers with impunity."¹ Another of these great speculating crazes was the tulip mania in Holland in the 17th century.²

The following figures show how this speculating tendency pervades the commercial world as represented in the Stock Exchange. The legislative committee of New York reported that in the three years preceding 1882 the optional cash sales of wheat in the New York Produce Exchange amounted to \$244,737,000, while the total of optional sales of all kinds during the same period rated up to the enormous sum of \$1,154,367,000. The United States Cotton Commission, sent to investigate the New Orleans cotton deal, in 1892, reported 52,000,000 bales as being disposed of on the New York Exchange, and 16,000,000 in the New Orleans, or 68,000,000 in all. As a matter of fact but *seven and three-fourths* millions bales all told were raised in the United States during that period, and a little over 400,000 of these were sent to New York. The surplus in both cases represent bogus sales. This is gambling on the largest scale, and that done in the name of legitimate business.³

Section 4. A feature closely allied with that of the state of tension, and largely influential in increasing it, pervades and permeates the whole fabric of the gambling impulse—that of luck. The term luck is used here in a large sense to include a group of phenomena very significant in the study of chance. It is this group of phenomena which it is the purpose of the present section to attempt to explain in its biological origin and values. As a foreword, I would like to lay especial emphasis on the implications of natural selection in respect to the presence of long existing and strongly tenacious psychic manifestations—to wit, that such manifestations are based upon psychic variations which must have been of use in the biological economy and thus have been of high selective value. The greater their permanence, and the stronger their tendency to express themselves, we must conclude that proportionately great was their importance in determining the fitness and survival of their possessors. Bearing this in mind through the ensuing

¹ *Ibid.*, Vol. I, pp. 67-69.

² McKay: *ibid.*, Vol. I, p. 89.

³ The article by Mr. Thomas (Amer. Jour. of Sociol., Vol. VI, pp. 751 ff.) speaks of this desire to get rid of routine and the interest in those forms of acquiring money—based on speculation and hazard.

chapter let us glance at some of the phases of those psychic manifestations which we will group under the term luck.

Father Lalemont,¹ in describing gambling among the Indians, tells how they prepare for the game: "They pass the night in shaking to find who is most adroit in spreading out their charms and exhorting them. They abstain from their wives, fast, sleep in the same cabin,—all this to have a lucky dream. Everything they dream would bring them luck is brought to the game in bags. They also bring to the game any old men who are supposed to have charms. When the game begins every one sets to praying and muttering, . . . with gestures and violent agitations of the hands, eyes and entire face, all for the purpose of attracting good fortune to themselves and exhorting their particular spirits to take courage and not let themselves be worried. Some are appointed to utter execrations and make contrary gestures for the purpose of forcing bad luck upon the other side and frightening the familiar spirits of the opposite party." This is a typical example among many to be found in the anthropological literature.

Richard Proctor² gives the following five things that gamblers hold: (1) Gamblers recognize some men as always lucky—as always "in vein."³ (2) Gamblers recognize those who start on a gambling career with singular luck, retaining that luck long enough to learn to trust in it confidently, and then losing it once and for all. (3) Gamblers regard the great bulk of their community, as men of varying luck—sometimes "in vein," sometimes not; men, who if they are successful, must, according to the superstitions of the gambling world, be most careful to watch the progress of events. If men will not withdraw when they are not "in vein," gamblers believe they will join the crew of the unlucky. (4) There are those, according to the ideas of gamblers, who are pursued by constant ill luck. If they win in the first half of the evening, in the last half they will lose more. (5) Gamblers recognize a class who, having begun unfortunately, have had a change of luck later, and have become members of the lucky fraternity. This change they ascribe to some action or event. For instance, the luck changed when the man married, his wife being a shrew; or because he took to wearing waistcoats; or because "So and So," who had been a sort of evil genius to the unlucky man, had gone abroad or died. Then there are espe-

¹ Culin: *ibid.*, p. 722.

² Luck: Its Laws and Limits, Longman's Magazine, Vol VIII, pp. 256-269.

³ The term "in vein" is difficult to translate. If a man is "in vein," luck favors him and he is sure to win. When he loses it is thus always attributed to luck.

cial phases in the belief in luck. Some believe that they are lucky on certain days in the week, unlucky on others. The skillful whist player, under the name of Pembridge, believes that he is lucky for five years; then unlucky for five years, and so on. Bulwer Lytton believed that he always lost at whist when a certain man was at the same table, or in the same room, or even in the same house." Mr. Proctor considers this belief in luck to be "the very essence of the gambling spirit." Robert Houdin gives the following maxims which he obtained from a gambler. The first three deal with the kind of game a man should play, that he should be calm and cool and not play for pleasure:

(4) A prudent player should put himself to the test to see if he is "in vein." In all cases of doubt you should abstain.

(5) There are persons constantly pursued by bad luck. To such I say—"Never play." (6) Stubbornness at play is ruin. (7)

Remember that fortune does not like people to be overjoyed at her favors, and that she prepares bitter deceptions for the imprudent who are intoxicated by success. Mr. Houdin sums up: (8)

"Before risking your money at play you must deeply study your 'vein' and the different probabilities of the game.¹"

The following is a typical case of the superstitious gambler: "This man believed that his clothes had an influence on his luck. If luck followed him he would wear the same clothes whether they were adapted to the weather or not. The same man believed in cards and seats. He objected to any one making a remark about his luck. He had the strongest objections to our backing him. He was distressed beyond measure if any touched his counters. His constant system of shuffling the cards was at times an annoyance. This was a great card player."²

Miss Bergen³ found the following superstitions to be current among gamblers and card players: (1) If your luck is poor walk around your chair three times, lift it, sit down, and your luck is secured (Gen'l in U. S.). (2) It is bad to play against the grain of the table (Gen'l in U. S.). (3) It is unlucky to turn up your hand before the dealer is through (Alabama). (4) It is common to blow on the deal without looking at it for good luck (Providence, R. I., and Salem, Mass.).

A's pet aversion is a man who puts his foot on his chair. He says, "When I tilt my chair back and find a foot on the rung I feel like swearing, as I know I am hoodooed for that round anyway." B will not play with a man standing behind him

¹ Les Tricherres des Grecs dévoilés. Quoted from Steinmetz, *ibid.*, Vol. II, 253-259.

² Knowledge: Vol. I, p. 223.

³ Current Superstitions, p. 79.

looking over his hand. C puts his stockings on wrong side out to bring him luck. Such cases as these might be multiplied indefinitely.

Rouge et Noir¹ gives the following superstitions common among gamblers: "To turn your back on the moon when playing for money portends ill luck; to lend money is unlucky; to play on borrowed money is unlucky; playing with money first laid on the altar Christmas night is lucky; some gamblers believe they can cheat luck by going from table to table, or playing at certain intervals. Beau Brummel believed that a crooked sixpence brought him luck and that, on losing it, his luck deserted him (Raikes Journal). In Germany the rhyme—

Lirurn, larum, broom sticks hot,
Aged women eat a lot.

written on a piece of parchment and kept in the gambler's pocket, was supposed to enable him to win large quantities of gold. In 1897 little China or golden pigs were treasured as fetiches to bring luck. The approach or touch of a hunchback is held to be a sign of luck. In London about Throgmorton Street (the paradise of stock brokers), there used to sit a man with a bag of nuts into which passers by thrust a hand, and if they guessed correctly the number, they would be paid a penny for each, if wrong, the guesser paid a penny. Many a speculator regulated his 'bulling' and 'bearing' by his successful or unsuccessful dip into the bag." Rouge et Noir continues, by giving some of the superstitions of Chinese gamblers.

The forms which this belief takes—such as, for example, belief in seats, clothes, etc., may be largely accounted for by association. I lost two or three times when such a person was in the game; losing becomes associated with him. Further, a generalization is made on this basis from one or two particular cases. Prof. Jastrow in a very interesting paper shows, also, that many of the forms of belief, and of superstitious practice, have their basis in the crude form of reasoning by analogy;² the clover on account of its trefoil form, suggesting trinity, is good against witches; the ill luck of thirteen and Friday—being probably due to religious associations, etc. This only explains why certain things come to have a lucky significance attached. It does not explain the belief itself. Let us consider this larger problem.

Prof. Stewart Culin, in a most comprehensive study,³ finds

¹ Gambling World, pp. 29-32.

² Fact and Fable in Psychology Ch. Natural History of Analogy, pp. 236-274. Boston and New York, 1900.

³ Chess and Playing Cards—Catalogue of Games and Implements for Divination exhibited by Natural Museum in connection with Atlantic Exposition, 1895. Smithsonian Report, 1896, pp. 665-942.

that the implements of gambling of primitive man have their origin in methods of divination, and gives many cases where the same methods and implements are used, now for gambling, now for divination. The following abridged abstract from Prof. Tylor shows the same facts. He points out that divination by lot was a branch of savage philosophy of high rank; though with us it is a mere appeal to chance, it was not so with them. It was to no blind chance that appeal was made when Matthias was chosen by lot to become the twelfth apostle, or when the Moravian Brethren chose wives for their young men by lot, or the Maories when they threw lots to find who among them was the thief,¹ or the Guinea negroes' appeal to the bundle of little leather strips in the hands of the priest;² or the Greeks, the ancient Germans,³ the ancient Italians⁴, or Modern Hindus when they left decisions, etc., to be determined by lot.⁵

"The uncivilized man thinks that lots or dice are adjusted in their fall with reference to the meaning he may choose to attach to it, and especially is he apt to suppose a spiritual being, standing over the diviner or gambler, shuffling the lots or turning up the dice to make them give their answers. This view held its place firmly in the Middle Ages, and later in history we still find games of chance looked on as results of supernatural operation." Thomas Gataker in a work "Of the Nature and Use of Lots" (1619), shows that this view prevailed at that time. Jeremy Taylor, forty years later, seems to give credence to the view.⁶ Tylor points out the vitality of this notion of supernatural interference as illustrated in the still flourishing art of the gamblers magic and the folklore of the day. "Arts of divination and games of chance are so similar in principle that the very same instrument passes from one use to the other. . . . In the Tonga Islands the cocoanut is now spun to see if a sick person will recover, now spun for amusement.⁷ In Samoa the spinning of the nut was formerly used as an art of divination to discover thieves, but now they only keep it as a way of casting lots and as a game of forfeits.⁸ . . . The connection between gambling and divination is shown by more familiar instruments.⁹ The huckle bones or astrali were used in divination in ancient Rome, being converted into rude dice by numbering the four sides, and even when the Roman gambler used the "tali" for gambling he would invoke a god or his mistress before the throw. . . . "The Chinese gamble by lots for cash and sweetmeats, whilst they also seriously take omens by solemn appeal to lots, kept in the temple, and professional diviners sit in the

¹ Polach: Vol. I, p. 220.

² Bosman: Guinees Kust Letters Eng. Trans. in Pinkerton, Vol. XVI, p. 399.

³ Tacitus: Germania 10.

⁴ Smith's Dic. of Gr. and Rome; art, oraculum, sortes.

⁵ Roberts: Oriental Illustrations, p. 163.

⁶ Jeremy Taylor: Ductor Dubitantium, in works, Vol. XIV, p. 337.

⁷ Mariner: Tonga Islands, Vol. II, p. 239.

⁸ Turner: Polynesia, p. 214; Williams, Figi, Vol. I, p. 228. Compare Cranz, Grönland, p. 231.

⁹ Cf. Smith's Dict., art, 'Talus.'

market place.¹ Playing cards are still used in Europe for divination. If it is a rule to be relied on that serious precedes the playful, then games of chance may be considered survivals in principle or detail from corresponding processes of magic,—as divination in sport made gambling in earnest."²

Space will not permit the writer to give here the mass of material that pertains to the belief in luck,—the lucky days, numbers, proverbs, the thousand and one charms and methods of avoiding bad, and bringing good luck. A volume has been written on the horseshoe alone. Suffice it to say that we have to do with a belief that was almost the guiding philosophy of action for centuries, and one that is not yet dead.

Miss Bergen has collected a volume of such beliefs still prevalent throughout the United States. She points out clearly that they are not merely 'survivals,' that these things only survive as long as endures that state of mind which originated them, that as thoughtless habit, such phenomena would not long persist, maintaining that her collection emphasizes the doctrine, that the essential elements of human nature continue to exist; and that "we can see the inclination has not disappeared, however checked by meditation or through complex experience, and however counteracted by the weight of later maxims. The examiner finds that he himself shares the mental state of the superstitious person."³

That the belief in luck still prevails was shown by a bit of recent Boston history—the "Lucky Box" craze of February, 1900—initiated by one Henry Parker. Large, conspicuous advertisements appeared for weeks in the daily papers—stating the wonderful powers of the lucky box, giving testimonials of those who had obtained marvellous success after having purchased one. It is estimated that Mr. Parker made seventy-five thousand dollars out of the scheme before his mail was stopped by the post office department, a period of three to five weeks. Though he had originally a plant, turning out a thousand boxes a day, he could not supply the demand. Twenty thousand letters addressed to Parker were held up at the Boston post office. An employee of a big transfer company said that he bought five boxes and enjoyed great luck. He said he knew a man who had won \$1,000,000 after he purchased a box.⁴

The following returns, received from college and normal school students, emphasize the same point.⁵ In all, 423 answers

¹ Doolittle: Chinese, Vol. II, pp. 108, 285-7, 384; Bastian, Oestl. Asien.

² Tylor: Primitive Culture, Vol. I, pp. 78-83.

³ Current Superstitions, p. 5, of Introduction.

⁴ Boston Herald, March 11, 1900, p. 8.

⁵ Cf. Topical Syllabus, Question VI.

were received. Of these, 140 were cases of persons who considered themselves lucky by nature; there were 51 cases of persons who considered themselves unlucky; 31 cases of persons who imagined themselves lucky; 27 cases who imagined themselves unlucky. There were 116 cases in which the subjects stated that there were certain days when they felt they would be lucky, and 76 cases in which, Micawber-like, the persons believed something good was coming their way.

A typical case or so of the man lucky by nature is instructive:

(1) "I have an uncle who is lucky. He is of a jolly disposition, seldom worries, and is very risky. He was in the Carl's Rock Railroad disaster, where the train fell down an embankment sixty feet high, and he escaped. He was in the fearful fire in a Brooklyn theater where hundreds of lives were lost, and he escaped. In the Civil War, a shell passed so close to his head that it carried away a small piece of his scalp, but otherwise he was uninjured, while his chum was killed by the very same shell. He was thrown from the cab of a locomotive into the tender, in another railroad accident, and escaped with very slight injuries. He narrowly escaped walking into the elevator shaft of a ten story building. His life has been a constant round of narrow escapes, and he succeeds where nearly every one else fails in both business and social life." (2) "It does not matter what this man does it seems to result in his gain. He can pick up four-leaf clovers nearly anywhere, and has found money and jewelry. If anything is lost he seems to have the power to find it easily. When he goes out gunning he shoots more game than nearly any one else in the crowd. He can find game where others cannot. In business transactions he never makes bad bargains."

(3) "There is a man at home who is very lucky. He made a fortune in enterprises along the board walk. Every one speaks of him as the luckiest of men. In three distinct cases after he had sold out his share in certain buildings they have burned down."

(4) "There is a friend of mine, who to my knowledge, has been lucky every day of his life. In speculations of every kind he is always successful, everything he undertakes turns into money."

(5) "I know a man who trusts to fate continually, and he never comes to harm. I'd be afraid to act as he does. One day when the ice in the pond was very thin he walked across the stream, and when somebody told him he would be drowned he said, 'Well if you are born to be drowned you will never hang.' He got over all right, but I do not think anybody else could have done it."

This belief that luck is of an individual nature is one of its most significant features. Brand cites a large number of cases, showing how fortune attaches itself in a peculiar individual manner.¹ Tylor gives the following interesting account of this phase of belief:

"The doctrine of patron, guardian, or familiar spirits has held its permanence through all grades of animism. Their especial function is twofold. First, while a man's own proper soul serves him for the

¹ Brand: *Pop. Antiq.*, Vol. I, pp. 365-367; cf. also Dyer: *Folklore of Shakespeare Under 'Luck.'*

ordinary purposes of life and thought, there are times when powers and impressions out of the course of the mind's normal action, and words that seem spoken to him from without, messages of mysterious knowledge of council or warning, seem to indicate the intervention of, as it were, a second superior soul, a familiar demon; . . . second, while common expected events of daily life pass unnoticed as in the regular course of things, such events as seem to fall out with especial reference to an individual, demand an intervening agent.

"Such deliverances are accounted for in the lower culture by the action of the patron spirit of guardian genius. Among the Watchandi of Australia the spirit of the man first slain by another enters the body of the slayer and becomes his warning spirit.¹ That the most important act of the North American Indian's religion is to obtain his individual patron genius or deity, is well known. In Chili,² as to guardian spirits, it has been remarked that every Arancanian imagines that he has one in his service. In Africa,³ the negro, and in Asia, the Mongol, has his guardian spirit. So also among the Aryan nations of Northern Europe and in Classic Greece and Rome, the doctrine may be traced.⁴ In the Roman world the doctrine came to be accepted as a philosophy of human life. Each man had his "genius natalis"—associated with him from birth to death, influencing his action and fate. In early and mediæval Christendom this belief continued to prevail. Luther remarks that a prince must have a greater, stronger, wiser angel than a count, and a count, than a private man. Bishop Bull says: 'I cannot but judge it highly probable that every faithful man at least has his particular good genius or angel, appointed by God over him, as the guardian and guide of his life.'"⁵

The following letter⁶ from a man of culture who visited Monte Carlo (and who played only once for the experience) is of value, as it is a faithful introspective account of his feelings on this subject.

"And what was my experience? This chiefly—that I was distinctly conscious of partially attributing to some defect or stupidity in my own mind, every venture on an issue that proved a failure; that I groped about within me for something in me like an anticipation or warning (which of course was not to be found) of what the next event was to be, and generally hit upon some vague impulse in my own mind which determined me; that when I succeeded I raked up my gains, with a half impression that I had been a clever fellow, and had made a judicious stake, just as if I had really moved a skillful move at chess; and that when I failed, I thought to myself, 'Ah, I knew all the time I was going wrong in selecting that number, and yet I was fool enough to stick to it,' which was, of course, a pure illusion, for all that I did know the chance was even, or much more than even, against me. But this illusion followed me throughout. I had a sense of *deserving* success when I succeeded, or of having failed through my own willfulness, or wrong-headed caprice, when I failed. When,

¹ Oedfield: Aborigines of Australia. In Trans. of Eth. Soc., Vol. III, p. 240.

² Molina: Chili, Vol. II, p. 86.

³ Waitz: Vol. III, p. 182.

⁴ Tyler gives many cases and references we are compelled to omit here.

⁵ Primitive Culture (1888), Vol. II, pp. 199-204.

⁶ Letter to the Spectator, Oct. 24, 1873, Saxon-les-Bains, "A Study in the Psychology of Gambling."

as not infrequently happened, I put a coin on the corner between four numbers, receiving eight times my stake, if any of the four numbers turned up, I was conscious of an honest glow of self-applause. I could see the same flickering impressions around me. One man, who was a great winner, evidently thought exceedingly well of his own sagacity of head, and others also, for they were very apt to follow his lead as to stakes, and looked upon him with a sort of temporary and provisional, though partially intellectual, respect. But what quite convinced me of the strength of this curious fallacy of the mind, was that when I heard that the youngest of my companions had actually come off a slight winner, having at the last moment retrieved his previous losses by putting his sole remaining two franc piece, out of the 125 francs he was willing to risk, on the number which represented his age, and gained in consequence thirty-two times his stake, my respect for his shrewdness distinctly rose, and I became sensible of obscure self-reproaches for not having made use of like arbitrary reasons for the selections of the various numbers on which I staked my money. It was true that there was no number high enough for that which would have represented my own age, so I could not have staked on that,—but then, why not have selected numbers whereon to stake that had some relation to my own life, the day of the month which gave me birth, or the number of the abode in which I work in town? Evidently, in spite of the clearest understanding of the chances of the game, the moral fallacy which attributes luck or ill luck to something of capacity and deficiency in the individual player, must be profoundly ingrained in us. I am convinced that the shadow of merit and demerit is thrown by the mind over multitudes of actions which have no possibility of wisdom or folly in them,—granted, of course, the folly in gambling at all,—as in the selection of the particular chance on which you win or lose. When you win at one time and lose at another the mind is almost unable to realize that there was no reason accessible to yourself why you won and why you lost. And so you invent what you know perfectly well to be a fiction—the conception of *some sort of inward divining rod* which guided you right, when you used it properly, and failed only because you did not attend adequately to its indications.”

We have here two important factors, one—the very essence of the belief in luck—and especially that phase of the belief represented by guardian angels, etc.,—a semi-conscious feeling of a guiding power which gives one a cue to the result; second, we have an exaggerated feeling of one's own skill. Both of these are closely allied, both have their basis in a feeling of self-confidence, and both are common to men playing games of chance or entering on chance adventures. These inner feelings or premonitions are very strong in gamblers—the “hunch,”¹ as it is called and, like the inner voice of Socrates, it is followed most religiously.

Closely allied to this is the rôle played by the imagination. Prof. Lazarus says: “The particular seductiveness of luck, the sirens, who in winning or losing entice from stake to

¹ The term “hunch” is very common among gamblers, and the religious strictness with which this “hunch,” or feeling in one of immediate coming success,—is followed,—is very significant.

stake, is 'die Phantasie.' The player hears in roulette the ball rolling, sees it fall and beholds himself a winner—"not as though it were a hope but as a living reality, does he perceive it with the inner eye and ear of the imagination." At first he puts no faith in the inner voice, but later he comes to believe in the phantom and wishes he had trusted in it.

The above facts, as well as those previously presented in the returns to the questioner, seem to point to one conclusion, viz., that one important element involved, is a strong passion for certainty, a longing for the firm conviction of assurance for safety. The uncertain state is desired and entered upon, but ever with the denouement focal in mind. In fact, so strong is the passion for the conviction of certainty that one is impelled again and again to enter upon the uncertain in order to put one's safety to the test. Thus, if successful, is the conviction of safety fostered and strengthened, and if unsuccessful, more prurient is the desire to try again to attain to success, and thus the general feeling of certitude, a little success tapping the whole hereditary reservoir in which the feeling of certitude lies latent. The feeling is thus out of proportion—either in success or failure to the stimulus. Thus, paradoxical as it may sound, gambling is a struggle for the certain and sure, *i. e.*, the feeling of certainty. It is not merely a desire for uncertainty.

We are here dealing with that same great passion for certitude which is the cornerstone of science, philosophy and religion—the desire to put the element of chance out of the game. We cannot do business with it. Take any game of chance, the player is pitted against a force which is different from a personal opponent. Here is a dark, inscrutable power which decides for or against him. As Lazarus says—the battle in chance games is not one of person against person, I against you; but now a new factor is present. This is *lawless chance* which determines the issue. There is no possibility of measuring the strength of the opponent; no means of estimating whether I will be a winner or loser.¹ It is because of this obscurity, because of the utter impossibility of prevision, that the player feels so utterly helpless before the unknown, in which there is no conception but that of chance as a deciding factor. On the side of chance is all the power and activity; on the side of the player all is impotence and passivity.

Such would be the condition of things when one acts in a game of chance or any chance environment, if there were no other psychic factors entering in to modify this. There is probably no case in which there are not other psychic factors,

¹ Lazarus: *ibid.*, pp. 73 ff.

else a man could scarce bring himself to the point of action. But the equalizing force, which always enters, is that of belief in luck or something akin. It is not blind chance which now decides, but there is a willing power. Lawlessness is put aside for fate, law or will. This is the very meaning of luck, the substitution of a conscious, determining force or will, for an indeterminable, precarious, headless chance,—law in place of lawlessness. The contest now becomes one between the players, each man's luck, against each other man's. It is not now a question of blind chance, but this—do you or I stand better with the deciding power, who wills? This, says Brinton, is the one feature underlying all religions—viz., that the great force of the world is a personal will.¹ This also is the feature which lies deepest in the gambler's consciousness. The attraction toward this dark, inscrutable power, plus a personal interest, is the background motive. One hopes by gripping the very ground of things to obtain the conviction of certitude. It so fascinates, one is impelled to experiment with it, test its relation to his own personality. It is a semi-unconscious desire—one ventures when he could not explain the reason. It is due to this same desire for a feeling of certitude that science, philosophy, religion, and all endeavor have derived one of their chief motives;—to fathom the fascinating unknown—to get the relief—the psychic “let down” from tension, a relief which the feeling of certainty always affords.

The significant fact, however, which the study of the gambler's consciousness, as well as that of men acting in uncertainty in general, impresses upon us is, that the feeling of certitude frequently exists even in a state of great uncertainty.

We see men having the same feeling of surety under the most precarious conditions. The conditions do not allow of prevision, but the subject feels and believes in himself, and in the favorable outcome of events, just as if prevision were possible. This conviction of safety, expressing itself in the more or less definite objective forms of luck, guardian angels, etc., is a definite biological product. Its effectiveness as a force in evolution in the increasing of action, is enormous. It is, we believe, an instinct-feeling as well defined as fear, its direct opposite, and like other similar psychoses, is a result of natural selection. We must remember that the state of doubt, bred by fear is ever and anon present in force—but still the opposite feeling holds its own, and must be in the ascendant at the moment of action. These two states so strongly counteracting each other are intermittent; now one is focal in consciousness, now the other. And this is precisely the economic value

¹ Primitive Religions, Ch. I.

of these anthropomorphic forms of belief—as luck totems, ceremonies, and formulas—to hold the faith-state focal.

We will term this feeling—faith—as directly opposite to fear; using faith in a much larger sense than in its general religious connotation. It has its physiological concomitants—the increase of blood-flow and general vital feeling, and is the underpinning of all such states of consciousness—as those of the gambler who believes that he will win next time, of the lottery player that he will be the holder of the winning number, of the soldier that the other man will be shot, of each of us who believes that he is born under a lucky star; it accounts for those ‘inner voices’ which tell us to do this or that, and we will win, those voices which led men into the belief in guardian angels, etc.; it also accounts for the gamblers ‘hunch,’ those strange premonitions—“Do this” or “avoid that,” and the belief in a special guiding Providence.

It is more definite than what we in general term self-confidence. It is the feeling: I have a special tip, a cue in touch with the very ground principle, who wills. It is the natural result in a race which has been evolved in an environment where to succeed and survive ventures and risks were necessary, and where those who did survive had been successful in their risks. Let us consider this.

McGee¹ in a very interesting account takes the position of a two-sided cosmos among animals and primitive man—“the danger side in the van;—the safety side in the rear—with self as an all important center;” and speaking of primitive man he writes: “Only religious adherence to experience shaped instincts enabled his survival and permitted his tribe to increase.” Further, he says: “Nearly all animals manifest a constant realization of three overshadowing factors in nature as they know it—factors expressed by danger, safety, self, or by death and life to self, or in general terms the *evil* of the largely unknown, and the *good* of the fully known,—co-ordinated in the vaguely defined subject of badness and goodness; and the chief social activities of animal mates and parents are exercised in gathering their kind into the brightness of the known and educating their native dread of all outer darkness. So, too, the more timid tribesmen . . . betray, in conduct and speech, a dominant intuition of a terrible unknown opposed through self to a small but kindly known. This intuition is not born of inter-tribal strife—it is merely the subjective reflection of implacable environment. . . . Over against this appalling evil, there is a less complete personified good, reflecting the small

¹ McGee, J. W.: American Anthropologist, Vol. I, No. 4, The Beginnings of Mathematics, pp. 646-674.

nucleus of confident knowledge with its far reaching penumbra of faith. . . . A vague yet persistent placement of the two sides is clearly displayed in the conduct of men and animals—the evil side is outward, the good side at the place or domicile of the individual, and especially of the group. . . . In general among the lower and more timid, the back stands for or toward the evil, the face toward the good, and among the higher and more aggressive, the face is set toward danger, *e. g.*; defensively birds and sheep, huddle with heads together, savages sleep with heads toward the fire, and timid tribesmen tattoo talismans on their backs, while litters of young carnivora lie facing in two or more directions, self-confident campers sleep with feet toward the fire, and higher soldiery think only of facing the foe.”

The early development of self-confidence and faith no doubt began in some such conditions. Only through the exploiting of this terrible *unknown* could knowledge be acquired and advancement gained. It is thus clearly seen how all variations in men along the line of faith in self, feelings of safety in danger and uncertainty would be of the highest selective value. Men with such a characteristic would in consequence be inclined to take greater risks, and those of them that were successful would be much favored in survival through their newly acquired knowledge. Thus the exploiting type of man with great interest in the unknown, with a feeling of immuneness from harm, with a strong feeling of coming success, was developed. In its early manifestations this feeling of safety was propped and strengthened by its objectification in such anthropomorphic forms as are exemplified in the complex structure of beliefs in luck, favoring deities, guardian angels, etc. The value of this feeling of certitude in an environment of uncertainty cannot be overestimated. It is a biological device to procure from men the greatest amount of activity—a device which takes no account of the safety of the individual. Antipodal to this feeling is that of fear. The two are ever in conflict. Character is largely determined by the relative strength in the individual of each. Every game of chance, every risk which a man runs, is an interrogation of his feeling—a question put to the powers that be, whether or no such a feeling is warrantable. Do I stand in with the deciding will or no? Fear says “No.” By being successful one gets a warrant, an assurance that he is lucky. Man will not believe that the deciding power is impartial to *him*. Who of us does not believe in his very soul, in the face of all evidence to the contrary, that *he* is “born under a lucky star?” It is one of the chief encouragements in life—this more or less vague feeling that a kindly fate is pulling our way. Each of us believes himself *sui generis* and that

the mighty will behind things is especially behind *him*. To men entering upon great enterprises such a feeling is indispensable. It made a Napoleon—the child of destiny—possible to the world. It also gave the Christian world its Christ.

Montesquieu and Diderot both were of the opinion that the gratifying self-reliance in the feeling that I am a special favorite of fortune, was the one particular motive of hazard plays.¹ For one who does not believe in blind chance, a pure game of chance, or any risk, is the purest form of obtaining an expression from the guiding power, or favor or disfavor. A phenomenon closely allied is the desire to have one's fortune told. It is a very indefinite notion of somehow getting a clue to how I stand in relation to the universal mechanism. This is the central problem in an environment of uncertainty.

Thus we see how closely the gambling impulse approximates the philosophical and religious motive. With the savage, as we have seen, gambling and religion are almost identical. The one chief incentive to the savage for gambling is to see how he stands with his favoring or disfavoring deities. The very implements he uses are developments from divinatory implements and often the same devices are used, now in divination, now in gambling. In deciding any specific case as to whether he will go to war, or as to which direction he shall proceed to forage for food, he trusts to the answer from his deities, as given by the fall of his divinatory implements. Has a theft been committed, his deities reveal the guilty man through the same means. In all fortuitous circumstances he trusts implicitly to these same divinatory means. And with these he gambles in his time of recreation. Is it not clear why gambling is of the most serious moment to him? Now he is not seeking encouragement or direction in a specific case but in a general case. He feels that the fall of these implements, directly guided by the deity, is pregnant with meaning respecting his general status with that being. Thus it is the savage is so desperate a gambler, regarding his whole fortune, aye, even his wives and children as insignificant in comparison with this decision for or against him. So also in a less intense degree is it with the modern believer in luck. This explains much of the almost inaccountable states of emotional frenzy gamblers display, and their tenacity in play.

Lucky or unlucky, that is the paramount issue with them both. No matter how much a man may understand of the calculus of probabilities, when he sits in the game, like the observer above quoted, he feels somehow he has in him a divining rod pointing the way to success if only he would be guided. The

¹ Lazarus: *ibid.*, pp. 72, 73.

step to absolute superstition is a short and easy one. Men need sorely the assurance of their being a vital part in the universal economy. Hence the unfailing interest in the transcendent. The philosopher seeks by reason to get a grip on the ground principle; the religious man seeks it by faith; the gambler, by faith strengthened by the favoring fall of the die.

Significant in this connection is the fact that there seems to be a correlation between the extensity and intensity of the gambling passion and the religious life of certain races. Prof. Lazarus, remarking on this, says: "That race which shows the deepest religious development of all races up to the present, that has built up and developed the richest and most sincere spiritual life, the Teutonic, showed in earliest times a passionate inclination toward chance plays. . . . The property, so clearly conspicuous in the course of the history of the Teutonic peoples for the transcendent, the abstract, and idealistic, shows itself also in the inclination toward those plays in which the idea of fate in dark form and figure is represented. Stern moralists might object to see the highest ideas placed in connection with immoral plays themselves; but psychological facts must be investigated without prejudice where it has to do with tracing back a historically believed universal property in the innate character of a folk spirit."¹

To realize the enormous rôle which this factor that we have termed faith, *i. e.*, the feeling of safety under circumstances of great uncertainty and risk, has played in the development of civilizations, a glance at one or two significant cases in history is necessary. The Jews in an environment of uncertainty, *i. e.*, wandering in the desert—with this feeling as a basis—created that system of monotheism, which has been adopted by the whole Christian world. As the gambler must have the conviction of safety in his staking in games of chance, and so, on this feeling of faith as a basis, creates the objective forms of luck, etc., so the Jew under the same stress created the most effective of all confidence producing agents—one omnipotent God—*who especially favored him*. In each case the principle is the same—that biological factor selected in the race—to instill confidence in the face of danger, that device to put chance out of the game. So wherever we find men acting under circumstances of great risk, we find this feeling asserting itself. Also it is where this conviction of immunity from danger is especially strong that we find races and individuals of the exploiting type. The Romans had it to an extraordinary degree. And as Tyler says: "In the Roman world the doctrine of guardian angels came to be accepted as a philosophy of human life.

¹*Ibid.*, pp. 79, 80.

Each man had his 'genius natalis'—associated with him from birth to death—influencing his action and fate." We have here the backbone of individualism and optimism.

Just as this state of mind was strong in the Jew and Roman—the two great exploiting individualistic races of the ancient world—so it is one of the chief factors in the Anglo-Saxon mind. As a prop to this feeling of certainty and safety, he also has his religion. The Anglo-Saxon race believes as firmly that it is the favored people of the one great God, as the Jew did two thousand years ago. And each individual believes that *he* is especially favored. His faith in his own ultimate safety and good fortune, is something stupendous. If a great gambling enterprise, as in the case of the Philippine Islands, presents itself—a whole nation cries "Manifest Destiny," and nearly every preacher in the land proclaims it to be the will of God. The gambler's faith in his luck—his constant belief that next time he will win, is but a fact similar to this.

It must be remembered, however, that though in every case the religion seems to give man this faith—it is the feeling of faith, this conviction of safety and certainty, which gave rise to this particular form of religious belief. On our thesis this feeling is one which has been selected in the course of evolution as a necessary factor in an environment of risk and uncertainty. It may have no objectification in religious or superstitious forms at all. In the case of men of genius this is often exemplified—as seen in the man who perceives a work to be done, precarious and uncertain in its outcome, yet who in his soul feels he is the man to accomplish that work and has little fear or doubt. This, says Pres. G. Stanley Hall, is the essence of genius. At root it is the same feeling or conviction of safety and certainty, as gave rise to such beliefs as luck, guardian spirits, and a special Providence. The only difference is that the man does not necessarily account for it by attributing its source to something external to himself, though often this is true as in case of Napoleon, "the child of destiny." From this standpoint we may expect a race in whom a large part of what we now call religious belief and motive, will be identical with normal life motives.

This factor of faith in self safety is often of a deleterious influence in cases of abnormal optimism where the individual trusts entirely to luck and not at all to his own effort. It is only too true that favorable chance is the goddess of the idle, the criminal and the desperate. On the other hand, this element of faith has additional value in that it places all the favorable things that happen to a man in italics. A horseshoe hung over your door is equivalent to underscoring everything fortunate which happens to you. The man who believes that

he is lucky selects and isolates the happy things which happen to him. Further, the belief that you will succeed in an uncertain and difficult undertaking is often half the battle.

CONCLUSION.

In the preceding we have attempted to study the psychic attitude and reaction of man in the face of one of the great conditioning factors in life—that of chance and risk. Study shows two opposite feelings arising, fear and faith, *i. e.*, a fluctuating feeling of certitude. The one tends to make man withdraw or at least remain inactive; the other to throw aside the idea of a blind chance and to replace it by one of law or order, *i. e.*, a favoring will, and in consequence leads to taking risks and, in general, increased activity. In gambling this latter feeling expresses itself predominantly, as in this play the faith type of man is selected. His belief in his immunity from harm, in his final success, is his most marked characteristic. This feeling of certitude is the great biological organ which functions to suppress the idea of chance and to minimize the respect for the danger in risk. It is closely in touch with the philosophical question which is the paramount issue of every life—"How do I stand in relation to the deciding will?" It is not surprising that this factor should be central in that great species of adult play which we have attempted to analyze in this study.

(2) The preceding study also suggests that an environment of uncertain content may be necessary to the human species, inasmuch as it has been evolved therein; that it is an essential condition to give that state of suspense which is the ideal condition of all forms of pursuit. This need of tension, together with the feeling of faith in one's safety, is perhaps one of the most effective of all agents reacting against the great psychic tendency toward fixity, a tendency which expresses itself in the formation of habits, and in the accepting of absolute standards,—the natural end being arrest of development.

(3) A third point worthy of emphasis is the emotional intensity incident to gambling—arising from the presence of many of the strongest egoistic instinctive feelings. We find that this is one of the chief incentives to gamble. To seek intense states of consciousness seems, as many writers have pointed out, a normal tendency. This tendency, which seems on the increase, may be of high selective value. The influence of intense emotional states on the bodily metabolism is now well recognized. The Indians realized their therapeutic value when, in cases of sickness, large gambling parties were assembled in which all present became intensely excited, often nearly wild. To these conventions the sick were brought. This is very suggestive. The race has probably nearly reached its

limit in evolution along anatomical development. But physiologically, the possibilities are unbounded. May it not be that this increasing tendency to seek emotional states is an attempt, through natural selection, to put man on a higher metabolic level. The psychology of excess of all kinds becomes a large problem in this light.

It is significant to note that we find gambling very prevalent in the early formative periods of society, and in newly exploited countries. Under these circumstances, the will to live increases with the increase of danger and uncertainty. Hence, intense emotional states which increase the feeling of the reality of self as well as the bodily metabolism—are sought. This, together with the exercise of the feelings of hope and faith in self that gambling affords, makes it in early states of society attractive. So in later periods gambling is indulged in as an outlet, a channelization of the pent up biological forces which a narrow specialized life does not afford. Man's biological heredity in the manifold form of various egoistic impulses cannot be ignored. They demand expression. There is, so to speak, a katabolic imperative. This outlet gambling furnishes in that it so well simulates the environment of primitive man. Again, a man in a narrow specialty feels his restrictions. He may be making needles and feel that he can make a machine. But give him strong emotional excitation, which increases the entire bodily metabolism, and he is on the metabolic level that he would be on were he making machines. He has all the enthusiasm and feeling of genius for the moment, though he may not be doing the work. Such results, gambling excitations, alcoholic intoxications, and the like produce. The problem is how to give normal emotional channelization, the safety valve of this biological heredity.

(4) The study of the gambling impulse further emphasizes the fact that man easily gives up the intellectual for the instinctive life; that he has not learned, as well as many writers would have us believe, the lesson of work and the power of sustained voluntary attention. This has been considered one of the great achievements of civilization. One of the chief motives for gambling, as we have seen above, is to obtain the rewards of labor without laboring. This is one of its chief pleasures, to have acquired a dollar without sustained toil. It is also worthy of note that often the gambler expends as much energy in obtaining his dollar as if he labored for it. In the one case, however, the attention is spontaneous, in the other voluntary.

(5) In the light of this investigation a few words in regard to theories of play may be instructive. It is a fair question whether plays of adults must be put under a different category

from plays of children. Let us take a retrospect. We have been dealing with a form of play found among all peoples. The following points are most significant: (1) Gambling has for one of its chief motives the acquisition of property—in other words, power. (2) Gambling calls forth some of the deepest of human instincts. It is a courting of fear—fear with which you must trifle, if, as it has been so well expressed, you wish to taste the intensest joys of living. So, also, it is the seeking after feelings of faith in self-safety in the face of danger—a play upon the hereditary orchestration of success in the race; a feeling which is our legacy in being the progeny of the survivors and the fit in the struggle for existence. So also, as we have seen, gambling raises into consciousness many egoistic instinct-feelings,—as the desire to dominate and humiliate your fellow, the love of conflict—your courage and power against mine, the satisfaction of being the object of jealousy, the pleasures derived from the exercise of cunning, deceit and concealment. (3) Gambling also excites the deepest of all interests in life—that in the transcendent, the dark obscure beyond. This, together with the general uncertainty of the environment, together with the fluctuations between faith and in self and ever recurring fear—plus the ever present seeking for material gain—gives that tension which to many is the very definition of life.

Can you find a half dozen deeper things in man than these, which form the very nucleus of this great play? It is, indeed, a simulation of life feelings. But of life in which all pity and sympathy for man is absent; in which self is the all important center; in which to gain, to fight and to feel God is with you, are all in all; in which each of these is intensified and exaggerated. Neither the theory of play set forth by Spencer nor that of Gross, nor any of the theories of play the writer has met, wholly satisfies these conditions. We meet here with an expression of instinct centers which no doubt are highly anabolic. But it is not necessarily a case of surplus energy in the organism which is the meaning of Spencer as I understand it. If these psychic phenomena be latent in some organic condition, and their manifestations depend on the cells of these organic centers being in an anabolic state, may it not be that those centers which are oldest, acquired first in the process of evolution, are first objects of nutrition, and that each organic center receives energy according to its priority of age, especially if for a long period it was required to function actively in the preservation of the species. Thus it might result, where the supply of energy was at any time insufficient for the whole organism, that these oldest organic centers would be nourished, while variations acquired later

would not, even though these might be of more value at the time in fitting the organism for survival. One answers immediately that those old organic conditions, having ceased to be of value and having become rudimentary organs, are finally sloughed off. But is this the case in the psychic realm? Is it not true that organs only become rudimentary through disuse? Do psychic centers ever cease to function actively? Do not old instincts—though of no value at present—still receive exercise by thrusting themselves at every possible opportunity into activity—especially in moments of recreation—determining thus, as I have mentioned, the forms and nature of play? At least it is clear, that this being the case, they tend to become rudimentary much less than is the case with other organs of the body. Even with these latter, may it not be that organs, such, for example, as the tail of the monkey, long resisted degeneration because, even after the establishment of the monkey in the terrestrial environment, the tail was used to swing the monkey in moments of recreation. Certain it is, there is a glow of satisfaction in using these once valuable organs. So in the psychic realm even though these instinct centers may in time become rudimentary, is it not at least clear that they resist degeneration a long time by thus expressing themselves in forms of play in moments of recreation? In the light of these considerations play, especially adult play, becomes a subject of not a little sociological and ethical importance. Thus in play, for a long time at least, a race would revive its psychic past, having created the stimuli prevalent in the primitive environment. Play would thus be an index to the history of the psychic life—a kind of historico-anthropological theater.

(6) As to the contribution of this study to the subject of ethics, it seems to the writer there is much which speaks for itself. Conduct is the result of latent biological forces; much conduct, being the forced expression of highly anabolic instinctive centers which have functioned through long previous periods in preserving the species. These resist for a long time degeneration, do not tend readily to become rudimentary, and hence are ever on the threshold of activity. Prohibition is impossible. If this activity is a menace to our present social conditions, substitutions must be offered. In other words these instinct-activities must be channelized into harmless courses. To accomplish this there is necessary a thorough study of these instincts in their biological and genetic origins. This gives us a hint of what ethics and also sociology may gain by leaning on their natural supporter—psychology.